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# ADAPTIVE LIMITS (AL)/ADAPTIVE MANAGEMENT (AM)

# DRAFT ISSUE PAPER

**NOTE: AGENCY POSITIONS ARE GUESSES, MEANT ONLY TO STIMULATE DISCUSSION. DO NOT DISTRIBUTE.**

This document addresses adaptive limits (AL) to water operations and adaptive management (AM).

The adaptive limits provide "sideboards" within which operations may be adjusted via adaptive management.

Adaptive management provides a means of improving management by making reducing uncertainty a management objective.

There are a number of principles describing the BDCP approach to AL and AM that need to be addressed. Where these principles (or alternative versions) are agreed to, they stand as guidance for further development of the BDCP. Where not agreed to, the disagreement or lack of resolution represents an issue that needs to be resolved.



## A. Adaptive Limits

1 – In the BDCP HCP, adaptive limits represent "sideboards" or boundaries constraining adaptive management of specific operational criteria determined to be critical to achieving the biological goals and objectives of the BDCP.

2 – The BDCP adaptive limits to water operations become effective after completion of the isolated facility.

3 – Adaptive limits are defined (following two options are mutually exclusive):

- (FWS, NMFS, ?) individually as limits on specific Project operating parameters, and collectively as the set of all such definitions. Parameters might include flows, diversion rates, storage volumes, water quality parameters, or other variables (or computed quantities based on them) that are relevant to achieving BDCP Goals and Objectives and are controllable or manageable by the Projects.
- (DWR, ?) via characterization of "blocks" of water that may be used for conservation purposes.

4 – Specific adaptive limits are chosen by best professional judgment or other defensible means based on best available information regarding the expected biological needs of covered species.

(A) (FWS, NMFS, DFG, ?) Adaptive limits are chosen to provide the flexibility to ensure that operational criteria are expected to be adequate to contribute to recovery of covered species, such that operational criteria can be adjusted via adaptive management to ensure contribution to recovery throughout the life of the permit.

(B) (FWS, NMFS, DFG, ?) Adaptive limits must reflect consideration of all reasonably foreseeable circumstances during the life of the permit.

## B. Adaptive Management

1 – Adaptive Management (AM) is a theory-based approach to management in the presence of uncertainty that seeks to achieve primary management goals and reduce uncertainty simultaneously. The DOI Adaptive Management Technical Guide (http://www.doi.gov/initiatives/AdaptiveManagement/index.html) and many other sources describe the process and its requirements.

2 – Adaptive management will be a key aspect of the BDCP and its implementation. Every Conservation Measure will require some degree of adaptive management to guide its implementation.



3 – The necessary preconditions for AM are (a) specific, definable uncertainty that affects management, (b) a definable system of management goals, and (c) a reasonable basis for thinking that it is possible to improve management by reducing uncertainty. If the preconditions for AM are present at the time the BDCP is formulated, then according to widely accepted principles AM should begin immediately.

4 – Strategies that adopt a reactive approach or otherwise "kick the can down the road" are not adaptive management, but forms of conventional management. New information that can improve management takes time to develop. Waiting for an adverse event to "trigger" AM ensures that it will take additional years beyond the triggering event to identify the appropriate course of management action. By beginning AM early and front-loading the search for ways to improve management, AM can avoid this pitfall.

6 – Adaptive management decision-making for the BDCP will require making hard choices. Testing management alternatives will certainly cost both water and money. Adaptive management will fail if hard choices needed to test management alternatives and implement new operational criteria cannot be made efficiently.

7 – Performance thresholds and criteria may be used to trigger features of the adaptive management plan.

## TO BE RESOLVED:

### Adaptive Limits

1 – (DWR) The adaptive limits for water operations reflect the following policy and regulatory considerations:

- (DWR, ?) The adaptive limits are compatible with the BDCP goal to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework.
- (FWS, ? response) Adaptive limits are biologically-based ranges of specific operational criteria that are designed to provide a range of adaptive management options; range chosen to ensure expectation that contribution to recovery of covered species and habitat and ecosystem objectives can be achieved over the life of the permit.
- (DWR, ?) The adaptive limits reflect the degree of scientific uncertainty and potential risk associated with gaps in data and information regarding the effect of the BDCP actions on covered species.
- (FWS, ? response) Probably agree with above.



- (DWR, ?) The adaptive limits provide for operational changes that are practicable and commensurate with the impacts of the covered activities.
- (FWS, ? response) Expected effect of adaptive limits choices consistent with permit issuance criteria.
- (DWR, ?) The adaptive limits provide sufficient flexibility to address current and ongoing uncertainties and data gaps regarding the species covered by the plan; however, they are not so broad so as to render regulatory assurances meaningless.
- (FWS, ? response) The adaptive limits provide sufficient flexibility to address current and ongoing uncertainties and data gaps regarding the species covered by the plan.
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2 – (FWS, NMFS, DFG?, DWR position unclear) Choice of adaptive limits will be informed by the BDCP Biological Goals and Objectives (G&Os), which define the desired outcomes of BDCP. The proposed

adaptive limits in Table 1 of the February 16, 2012 "Working Draft Adaptive Management for Water Operations" paper have not been agreed upon by all parties.

3 – There is disagreement about how adaptive limits are formulated.

- (DWR) A 700 TAF 'water block' with a floor of 5.3 MAF of average annual exports and a ceiling of 6 MAF of average annual exports.
- (FWS, NMFS, ?) 'Water block'-based limits are not a suitable approach, for at least three reasons.
    (A) Limits contingent on overall water supply impacts are not biologically justifiable.
    (B) 'Water block' approaches interfere with the working of adaptive management by adding additional constraints on the adjustment of critical operational parameters. It is very unlikely that all parameters might be simultaneously adjusted to their most stringent limits; however, it is important that it be possible to make changes within the defined adaptive limits of each parameter as a scientifically defensible adaptive management outcome in the event such changes are needed.
    (C) 'Water block' and other water-supply based approaches create a substantial water accounting burden that has proven in the past (e.g. Environmental Water Account) to impede adaptive management.



## Adaptive Management Governance

1 – There is disagreement about what entity should make or ratify AM decisions including approval of AM plans.

- (DWR) Proposed that two groups, the Implementation Board (excluding FWS, NMFS, DFG) and the Permit Oversight Group (excluding all but FWS, NMFS, DFG), would make these decisions, with POG relegated to a role of blessing or rejecting annual work plans and other final products.
- (FWS, NMFS, DFG, ?) The "five agencies" principals group (consisting of the regional directors of the federal agencies and directors of the state agencies) is the appropriate body to make or ratify important AM decisions and approve AM plans. The "five agencies" to manage all the functional components of AM except for implementation of water project operations, which would be the province of Reclamation and DWR. Water contractors and other stakeholders to have an ex officio or advisory role in technical/scientific components of AM.

2 – There is disagreement about what entity should be the final arbitor of disputes.

- (DWR, ?) Proposed federal Cabinet-level officials and the Governor.
- (FWS, NMFS, DFG?, ?) The "five agencies" principals group (i.e. the state agency directors and federal agency regional directors/administrators) is the appropriate final destination for dispute resolution pertaining to BDCP adaptive management.

3 – (Unclear whether this is a point of agreement – anybody?) The component functions of BDCP AM need to be conducted as a collaborative partnership of the "five agencies," other key State and Federal agencies, and stakeholders. Important component AM functions should be carried out by an Adaptive Management Team (AMT) consisting of managers representing the "five agencies", the State Board, EPA, ACOE, the BDCP manager, the BDCP science manager, one or two representatives each of the other authorized entities and NGO stakeholders, the IEP lead scientist(?), and the SFWCA science manager(?). Final AM component management decisions that cannot be made by this Team should be referred to the "five agencies" principals group.

4 – There is disagreement or at least confusion about the role of the AMT versus other groups such as the Implementation Office. (FWS, NMFS, DFG, ?) Key adaptive management component functions to be implemented by the AMT include (draft list) the following.

(A) Analysis of uncertainty and definition of management issues to be addressed through AM

(B) Development of potential management actions and management alternatives

(C) Scientific studies, monitoring, and performance assessment for BDCP

(D) Results interpretation and analysis of potential management action adjustments for BDCP

(E) Oversight of peer review, including formulation of charges to reviewers



5 – There is disagreement about the time step of AM review and implementation. The State proposal was an annual review and implementation time step. Shorter and longer time steps may also be warranted.

6 – There is disagreement about what will constitute sufficient scientific certainty to initiate a permanent water operations change within the adaptive limits.

## NEXT STEPS:

1 – The IMT will document decisions by the Agency Principles regarding any of the disagreements outlined above.

2 – The IMT will document which aspects of the State proposal it is uncertain can be reconciled with the requirements of the ESA and NCCPA.

3 – The IMT will continue to discuss issues it may be able to resolve.

4 – The IMT will compile all of the above to develop a 5-Agency draft plan for adaptive limits and adaptive management governance to support the July decision point.